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(54) DISPENSING CLOSURE FOR SQUEEZE BOTTLE

AUSGABEVERSCHLUSS FÜR QUETSCHFLASCHEN

BOUCHAGE DE DISTRIBUTION POUR FLACON PULVERISATEUR

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(73) Proprietors:
- **PERLMUTTER, Thom M.**
  Tarzana, California 91306 (US)
- **Bennett, Edward M.**
  Glendora, California 91740 (US)

(72) Inventor: **Perlmutter, Thom M.**
Tarzana, CA 91306 (US)

(74) Representative: **Fiener, Josef**
Patentanwälte
Kahler, Käck, Fiener et col.,
P.O. Box 12 49
87712 Mindelheim (DE)

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Description

Technical Field

The present invention relates to a liquid dispensing closure especially useful on plastic squeeze bottles. Such bottles commonly contain liquid or semi-liquid substances, such as soft drinks, mineral water, cleaning liquids, ketchup, lubricating oil, etc.

Disclosure of Invention

The dispensing closure of the invention is disclosed by the features of claim 1.

One embodiment of the invention includes an axially slidable closure body having one open and two closed positions relative to a plastic cap member which fits into the neck portion of a plastic squeeze bottle. In the first of the two closed positions, the closure body has a first sealed connection with a plug type valve surface within the cap member, and the closure body has a sealed connection with a post extending axially within the cap member. Additionally, a sealed connection is provided by a tubular sleeve surrounding the post. The four positive seals thus provided provide very positive insurance against leakage.

In a second closed position, the closure body has a sealed connection with the post and the cap member sleeve and the closure body is disengaged from the plug type valve surface. The purpose of this second closed position is to provide a low friction connection between the closure body and cap member, whereby the closure body can be easily and readily moved between the second closed position and a third open position with very little human effort. Typically, the closure body would be maintained in its second closed position during periods when the squeeze bottle is in active use for dispensing purposes, -- e.g., while riding a motorcycle, driving a vehicle, during sports activities, or at meals or other occasions when it is desired that the squeeze bottle be closed, but readily available for quick intermittent dispensing of liquid with an easy movement of the closure body.

In another embodiment of the invention, the closure body has a closed position, an open position, and an intermediate position allowing a reduced quantity of liquid to flow through its dispenser opening. A sealing bead on the closure body acts as a deformable stop releasably to retain the closure body in its intermediate position. With the closure body in its intermediate position, a manual squeeze action on the plastic bottle causes a limited quantity of liquid to be discharged from the dispensing closure.

The dispensing closure may be so constructed that the closure body is confined to a straight push-pull motion between its limiting positions. Alternately, the closure may be designed to have a rotary lock motion when the closure body is in its fully closed position. The rotary lock motion includes a wedge or cam feature whereby a very tight seal is produced between the closure body and the cap member. A tight seal is desirable, e.g., when the bottle contains a carbonated beverage, thus requiring containment of the gas pressure in order to preserve the quality of the beverage.

Background Art

In some respects the dispensing closures disclosed herein are similar to a closure means shown in U.S. Patent 3,777,936 (R. Hazard) disclosing a dispensing closure according the pre-characterizing features of claim 1. However, the Hazard closure does not disclose significant features of the present invention, including a relatively easy slide motion of the closure body, or a large multiplicity of positive seals, or a variety of different closure positions, or a gas-tight rotary wedge lock action.

Brief Description of Drawings

Figure 1 is a sectional view taken through a dispensing closure embodying the present invention;
Figure 2 is a sectional view taken at line 2-2 in Figure 1, showing a movable closure body in a different position of adjustment;
Figure 3 is a transverse sectional view taken on line 3-3 in Figure 2;
Figure 4 is a view taken in the same direction as Figure 1, showing the movable closure body in a fully closed position;
Figure 5 is a fragmentary sectional view showing structural details of the dispensing closure of Figures 1 through 4;
Figure 6 is a view like that of Figure 5, showing structural details of another embodiment of the invention;
Figure 7 is a perspective view, partially in section of another liquid dispensing closure embodying the invention;
Figure 8 is a view taken like that of Figure 7, but showing the closure body in a different position of adjustment;
Figure 9 is a sectional view taken on line 9-9 in Figure 7;
Figure 10 is a fragmentary enlarged view of the structural features circled at 10-10 in Figure 9;
Figure 11 is a view taken on line 11-11 in Figure 8;
Figure 12 is a sectional view taken on line 12-12 in Figure 9; and
Figure 13 is a fragmentary view taken on line 13-13 in Figure 12.

Best Mode for Carrying Out the Invention

Referring to the drawings, Figures 1 to 5 show a liquid dispensing closure for use on the neck portion of a plastic squeeze bottle. The dispensing closure includes a one-piece plastic cap member 10 having a central axis 8. The cap member includes a radial wall 12

adapted to form an end wall of the bottle, an annular skirt 14 concentric with axis 8 and adapted for threaded connection about the externally threaded neck portion of the squeeze bottle, and a tubular sleeve 16 extending axially from wall 12 to form a mouth opening 17. Two internal arms 19 extend from wall 12 parallel to axis 8 to support a radial disk 21 within the space circumscribed by skirt 14. A short cylindrical plug 23 extends axially from disk 21 to form a cylindrical valve surface 24. An elongated cylindrical post 25 extends axially from plug 23 through mouth opening 17.

The movable component of the device comprises a unitary plastic closure body 26 which has an elongated tubular side wall 27 terminating at one end in an external flanged end wall 29. A cylindrical dispenser opening 31 extends through end wall 29 in axial alignment with post 25. Elongated side wall 27 has an annular detent rib 33 configurated and sized selectively to extend into either of two annular grooves 35 and 37 defined in the inner surface of stationary sleeve 16. Side wall 27 also has an annular sealer bead 39 adapted slidably to engage the inner surface of sleeve 16.

As best seen in Figure 5, each groove 35, 37 is of rectangular cross section. The associated detent rib 33 has an essentially semi-circular cross-section, whereby the rib has two-point engagement with the sleeve 16 inner surface. The radial depth dimension of each annular groove 35 or 37 is measurably greater than the radial projection of detent rib 33, thus to ensure that the rib engages the groove edges only at the desired lines of contact. The rib can seal against the sleeve 16 groove at two axially spaced locations.

Figure 5 shows sealer bead 39 as being of triangular cross section, with an apex area facing the inner surface of sleeve 16. When bead 39 is in slidable engagement with the sleeve 16 surface (Figure 1 condition), the apex area of the bead may be slightly deformed by the contact pressure, thus to provide a thick line sealing engagement with the sleeve surface. The outer diameter of tubular wall 27 is measurably less than the inner diameter of sleeve 16, whereby there is clearance and a frictionless connection between the tubular wall and sleeve, except for the presence of rib 33 and bead 39.

Figure 4 shows the components in a fully closed condition. End area 40 of tubular side wall 27 sealably encircles plug surface 24, while post 25 has a sealing fit in dispenser opening 31. Detent rib 33 has a sealed fit within groove 37. The edge surface of hole 31 is parallel to the side surface of post 25, whereby there is extensive contact between the two surfaces in the Figure 4 condition. The diameter of opening 31 may be slightly smaller than the diameter of post 25, such that the hole surface can tightly grip the post for an enhanced sealing action.

Figure 2 shows the components in a second closed position wherein body 26 is pulled outwardly to a position in which the post still has a sealed fit in the dispenser opening 31, and detent rib 33 has a sealed fit within groove 35.

Figure 1 shows the closure body 26 in an open position wherein it is disengaged from post 25. Two outwardly radiating flanges 41 on wall 27 limit the motion of body 26. As shown in Figure 3, flanges 41 extend within the circumferential open spaces between arms 19. When closure body 26 is pulled to the Figure 1 position, flanges 41 engage wall 12, thereby limiting the motion of the closure body. In the Figure 1 position, bead 39 has sealing engagement with the sleeve 16 inner surface. Movement of the closure body between the Figure 1 and Figure 2 positions is easily accomplished because there is no frictional resistance between tubular side wall 27 and plug surface 24. Figure 2 shows an intermediate closed position.

Arms 19 are located on a diametrical line extending through central axis 8 so that the circumferential spaces between the arms serve as passages for unrestricted liquid flow into the space within tubular wall 27 in the Figure 1 position or the Figure 2 position.

Figure 6 illustrates another embodiment of the invention, wherein only one annular groove 37 is defined in the inner surface of stationary sleeve 16. This embodiment provides only the one closed position or configuration shown in Figure 6, which corresponds generally to the closed position shown in Figure 4 for the earlier-described embodiment. Shown in broken lines in Figure 6 is the position of detent rib 33 when closure body 26 is in its fully open position, which position corresponds to the open position shown in Figure 1 for the earlier-described embodiment.

The axial location of sealer bead 39 is such that when closure body 26 is pulled to a position of engagement between bead 39 and the interior or lower face 13 of end wall 12, the surface of dispenser hole 31 is slightly spaced from the spherical end surface of post 25. Indicated at 15 is the plane of closure body interior surface 18 when bead 39 is engaged with surface 13 of wall 12. The spacings are such that a relatively small annular crack is formed between the opening 31 surface and the spherical end surface 30 of post 25. When a squeeze force is applied to the plastic squeeze bottle, a limited flow or squirt of liquid is effected through hole 31.

Annular bead 39 has a sufficient projection from tubular wall 27 that when bead 39 reaches surface 13 the bead forms a releasable detent for retaining closure body 26 in position to permit limited liquid flow through dispenser opening 31. However, the user can readily pull closure body 26 a further distance to a fully opened condition wherein flanges 41 engage with surface 13 of wall 12.

The Figure 6 closure body 26 has three positions of adjustment, namely the closed position shown in full lines in Figure 6, or a slightly opened position in which bead 39 is in contact with surface 13, or a fully opened position in which flanges 41 are in contact with surface 13.

Figures 7 through 13 show another embodiment of the invention wherein closure body 26 has the same

configuration and sealing element spacing as the corresponding closure body of the embodiment of Figure 6. However, the Figure 7 embodiment has a rotary twist lock feature and structure not provided by Figure 6 construction. Cap member 10a includes two internal arms 19a spaced on a diametrical line extending through cap member axis 8. As shown in Figure 12, each arm 19a has a circumferential width dimension 44 measured about axis 8. However, each arm 19a has a reduced circumferential dimension in the vicinity of the associated disk 21. Thus, the lower end portion of each arm 19a is cut away to form a circumferential slot 45. The roof surface 47 of each slot 45 is inclined or angled slightly relative to surface 22 of disk 21, as indicated at 49 in Figure 13.

Each flange 41 at the lower end of tubular wall 27 is movable into a slot 45 when closure body 26 is pushed downwardly to the closed position of Figures 7 and 9. Figure 7 shows one of flanges 41 in position for rotary movement into a slot 45. Figure 13 shows the flange 41 after rotation of closure body 26 from its Figure 7 position. The rotary motion is achieved by manual manipulation of flanged end wall 29. Arrow 50 in Figure 7 indicates the direction and general magnitude of motion required to move the flanges 41 into slots 45.

The inclination of each slot roof surface 47 exerts a cam action on the upper surface of each associated flange 41, whereby the flanges are wedged into slots 45. The wedging action causes end surface 51 of tubular wall 27 to form a gas-tight seal against disk surface 22. In the arrangement of Figures 7 through 13, wall 27 has two sealing engagements, i.e., against the side surface 24 of plug 23, and against disk surface 22.

In major respects, the dispensing closure of Figures 7 through 13 is identical to the closure of Figure 6. The Figure 7 arrangement has an added rotary twist lock feature for enhanced sealing action when closure body 26 is in the closed position of Figures 7 and 13. The rotary twist lock feature may be used in combination with the multi-position closure body of Figures 1 through 5.

Claims

1. A liquid dispensing closure for a squeeze bottle, comprising:

   a unitary circular plastic cap member (10, 10a) having an end wall (12), an annular skirt (14) extending axially from the bottle end wall for disposition about the neck of a squeeze bottle, a tubular sleeve (16) extending axially from the end wall (12) to define a mouth opening (17), two arms (19, 19a) extending axially from said end wall (12) with the space circumscribed by the skirt (14), a radial valve disk (21) connected to said arms (19, 19a) in axially spaced relation to the said end wall (12), a cylindrical plug (23) extending axially from said disk (21) to form a cylindrical valve surface (24), and a cylindrical post (25) extending axially from said plug (23) through said mouth opening (17) defined by said tubular sleeve (16), and

   a unitary plastic push-pull closure body (26) including an elongated tubular side wall (27) extending within and through the space defined by the tubular sleeve (16), and a manually-operable flanged end wall (29) extending transversely of the tubular side wall (27) externally of the cap member (10, 10a), said flanged end wall (29) having a liquid dispenser opening (31) in axial alignment with said post (25), whereby axial movement of the closure body (26) moves the dispenser opening (31) onto or off of the post (25), said tubular side wall (27) having a free end area (40) remote from the flanged end wall (29) adapted to telescope onto or off of said cylindrical plug (23) during axial motion of the closure body (26),

   said tubular sleeve (16) having at least one internal annular groove (35, 37) in proximity to its mouth opening (17), said tubular side wall (27) having an annular detent rib (33) sized to extend into the at least one annular groove (35, 37) to form a liquid seal between the sleeve (16) and tubular side wall (27),

   said closure body (26) having a closed position wherein said post (25) has a sealed connection with said dispenser opening (31) and said annular detent rib (33) has a sealed fit within said at least one annular groove (35, 37),

   said closure body (26) having an open position wherein said dispenser opening (31) is axially spaced from said post (25), characterized in that

   said tubular side wall (27) has an annular sealer bead (39) adapted for slidable engagement with the inner surface of the tubular sleeve (16), the free end of the tubular side wall (27) having two outwardly radiating flanges (41) adapted to move between said disk (21) and said cap member end wall (12) to limit the motion of the closure body (26) and wherein said sealer bead (39) is in sealed engagement with the inner surface of the tubular sleeve (16) when the bead (39) is in slidable engagement with the tubular sleeve (16).

2. A dispensing closure according to Claim 1, wherein:

   the free end (40) of said tubular side wall (27) sealably encircles said plug (23) when the closure body (26) is in its closed position.

3. A dispensing closure according to Claim 1, wherein:

the outer diameter of the tubular side wall (27) is measurably smaller than the inner diameter of the tubular sleeve (16), whereby the sleeve (16) offers no frictional resistance to axial motion of the closure body (26).

4. A dispensing closure according to Claim 1, wherein:

the annular groove (35, 37) is rectangular in cross section, and said detent rib (33) is of curvilinear cross section, whereby said rib (33) has engagement with the groove (35, 37) at two spaced positions along the sleeve inner surface.

5. A dispensing closure according to Claim 4, wherein:

the radial depth dimension of the annular groove (35, 37) is measurably greater than the radial projection of the detent rib (33).

6. A dispensing closure according to Claim 4, wherein:

the sealer bead (39) is triangular in cross section with an apex area thereof facing the inner surface of the tubular sleeve (16).

7. A dispensing closure according to Claim 1, wherein:

said arms (19, 19a) have circumferentially-extending slots (45) communicating with one face of said radial disk (21), and
said closure body (26) is manually rotatable for moving said outwardly radiating flanges (41) into said slots (45).

8. A dispensing closure according to Claim 7, wherein:

each slot (45) is defined partly by a roof surface (47) acutely angled to the plane of the radial disk (21), whereby said flanges (41) are wedged tightly against the disk surface (24) during movement thereof into the slots (45).

9. A dispensing closure according to one of claims 1 to 8, wherein:

said tubular sleeve (16) has a first and a second internal axially-spaced annular groove (35, 37) in proximity to its mouth opening (17), and said annular detent rib (33) is sized to selectively extend into either annular groove (35 or 37) to form a liquid seal between the sleeve (16) and tubular side wall (27), and

said closure body (26) having a first closed position wherein said post (25) has a sealed connection with said dispenser opening (31) and said annular detent rib (33) has a sealed fit within said second groove (37),

said closure body (26) having a second closed position wherein said post (25) has a sealed fit within the dispenser opening (31), and said annular detent rib (33) has a sealed fit within said first groove (35),
said closure body (26) having a third open position wherein said dispenser opening (31) is axially spaced from said post (25), and said sealer bead (39) is in sealed engagement with the inner surface of the tubular sleeve (16) when the bead (39) is in slidable engagement with the tubular sleeve (16).

10. A dispensing closure according to Claim 9, wherein:

each annular groove (35 and 37) is rectangular in cross section, and said detent rib (33) is of curvilinear cross section, whereby said rib (33) has two point engagement with the groove (35, 37) along the sleeve inner surface.

11. A dispensing closure according to one of claims 1 to 10, wherein:

said arms (19, 19a) being disposed on a diametrical line extending through the cap member central axis (8), the circumferential spaces between said arms (19, 19a) being open for passage of liquid therethrough.

Patentansprüche

1. Flüssigkeitsausgabeverschluß für eine Quetschflasche, aufweisend:

ein einstückiges kreisförmiges Kunststoffkappenelement (10, 10a) mit einer Stirnwand (12), einem sich zur Anordnung um den Hals einer Quetschflasche axial von der Flaschenstirnwand weg erstreckenden ringförmigen Rand (14), einer Auslauföffnung (17), die sich axial von der Stirnwand (12) weg erstreckt, um eine rohrförmige Hülse (16) zu begrenzen, zwei Armen (19, 19a), die sich axial mit dem vom Rand (14) umschriebenen Raum von der Stirnwand (12) weg erstrecken, einem radialen Ventilteller (21), der in axial beabstandeter Beziehung zu der Stirnwand (12) mit den Armen (19, 19a) verbunden ist, einem zylindrischen Verschlußstopfen (23), der sich axial von dem Teller (21) weg erstreckt, um eine zylindrische Ventilfläche (24) zu bilden, und einem zylindrischen Stutzen (25), der sich axial von

dem Verschlußstopfen (23) durch die Auslauföffnung (17) erstreckt, die durch die rohrförmige Hülse (16) definiert ist, und

einen einstückigen Kunststoff-Druck-Zug-Verschlußkörper (26) mit einer länglichen rohrförmigen Seitenwand (27), die sich in dem und durch den von der rohrförmigen Hülse (16) begrenzten Raum erstreckt und einer manuell betätigbaren umgebördelten Stirnwand (29), die sich außerhalb des Kappenelementes (10, 10a) quer zu der rohrförmigen Seitenwand (27) erstreckt, wobei die umgebördelte Stirnwand (29) eine Flüssigkeitsausgabeöffnung (31) in axialer Ausrichtung mit dem Stutzen (25) aufweist, wodurch eine Axialverschiebung des Verschlußkörpers (26) die Ausgabeöffnung (31) auf den Stutzen (25) hinauf- oder davon abrückt, wobei die rohrförmige Seitenwand (27) abgelegen von der umgebördelten Stirnwand (29) eine freie Endfläche (40) aufweist, die geeignet ist, während der Axialverschiebung des Verschlußkörpers (26) auf den zylindrischen Verschlußstopfen (23) hinauf- oder davon weggeschoben zu werden,

wobei die rohrförmige Hülse (16) in der Nähe ihrer Auslauföffnung (17) zumindest eine Innenringnut (35, 37) aufweist, wobei die rohrförmige Seitenwand (27) eine ringförmige Arretierungsrippe (33) aufweist, die so bemessen ist, daß sie sich in die zumindest eine Ringnut (35, 37) hinein erstreckt, um eine Flüssigkeitsdichtung zwischen der Hülse (16) und der rohrförmigen Seitenwand (27) zu bilden,

wobei der Verschlußkörper (26) eine geschlossene Stellung aufweist, in der der Stutzen (25) eine dichte Verbindung mit der Ausgabeöffnung (31) aufweist und die ringförmige Arretierungsrippe (33) einen dichten Sitz in der zumindest einen Ringnut (35, 37) aufweist,

wobei der Verschlußkörper (26) eine offene Stellung aufweist, in der die Ausgabeöffnung (31) axial von dem Stutzen (25) beabstandet ist,

dadurch gekennzeichnet, daß

die rohrförmige Seitenwand (27) eine ringförmige Dichtwulst (39) aufweist, die zum verschiebbaren Eingriff mit der Innenfläche der rohrförmigen Hülse (16) geeignet ist, wobei das freie Ende der rohrförmigen Seitenwand (27) zwei nach außen abstehende Flansche (41) aufweist, die zum Verschieben zwischen dem Teller (21) und der Stirnwand (12) des Kappenelementes geeignet sind, um die Bewegung des Verschlußkörpers (26) zu begrenzen, und wobei die Dichtwulst (39) in dichtem Eingriff mit der Innenfläche der rohrförmigen Hülse (16) ist, wenn die Wulst (39) in verschiebbarem Eingriff mit der rohrförmigen Hülse (16) ist.

2. Ausgabeverschluß nach Anspruch 1, wobei das freie Ende (40) der rohrförmigen Seitenwand (27) den Verschlußstopfen (23) dichtfähig umgibt, wenn der Verschlußkörper (26) in der geschlossenen Stellung ist.

3. Ausgabeverschluß nach Anspruch 1, wobei der Außendurchmesser der rohrförmigen Seitenwand (27) meßbar kleiner ist als der Innendurchmesser der rohrförmigen Hülse (16), wodurch die Hülse (16) der Axialbewegung des Verschlußkörpers (26) keinen Reibungswiderstand bietet.

4. Ausgabeverschluß nach Anspruch 1, wobei die Ringnut (35, 37) einen rechteckigen Querschnitt aufweist und die Arretierungsrippe (33) einen gebogenen Querschnitt aufweist, wodurch die Rippe (33) an zwei beabstandeten Stellen längs der Hülseninnenfläche einen Eingriff mit der Nut (35, 37) aufweist.

5. Ausgabeverschluß nach Anspruch 4, wobei das radiale Tiefenmaß der Ringnut (35, 37) meßbar größer ist als der radiale Vorsprung der Arretierungsrippe (33).

6. Ausgabeverschluß nach Anspruch 4, wobei die Dichtwulst (39) einen dreieckigen Querschnitt aufweist, wobei eine Scheitelfläche davon der Innenfläche der rohrförmigen Hülse (16) zugewandt ist.

7. Ausgabeverschluß nach Anspruch 1, wobei die Arme (19, 19a) in Umfangsrichtung verlaufende Schlitze (45) aufweisen, die mit einer Seite des radialen Tellers (21) in Verbindung stehen, und der Verschlußkörper (26) manuell drehbar ist, um die nach außen abstehenden Flansche (41) in die Schlitze (45) zu schieben.

8. Ausgabeverschluß nach Anspruch 7, wobei jeder Schlitz (45) teilweise von einer in spitzem Winkel zur Ebene des radialen Tellers (21) angeordneten Dachfläche (47) begrenzt ist, wodurch die Flansche (41) während ihres Hineinschiebens in die Schlitze (45) fest mit der Tellerfläche (24) verkeilt werden.

9. Ausgabeverschluß nach einem der Ansprüche 1 bis 8, wobei die rohrförmige Hülse (16) in der Nähe ihrer Auslauföffnung (17) eine erste und eine zweite axial beabstandete Innenringnut (35, 37) aufweist und die ringförmige Arretierungsrippe (33) so bemessen ist, daß sie sich selektiv in eine der Ringnuten (35 oder 37) erstreckt, um eine Flüssigkeitsdichtung zwischen der Hülse (16) und der rohrförmigen Seitenwand (27) zu bilden, und

wobei der Verschlußkörper (26) eine erste geschlossene Stellung aufweist, in der der Stutzen (25) eine dichte Verbindung mit der

Ausgabeöffnung (31) aufweist und die ringförmige Arretierungsrippe (33) einen dichten Sitz in der zweiten Nut (37) aufweist,

wobei der Verschlußkörper (26) eine zweite geschlossene Stellung aufweist, in der der Stutzen (25) einen dichten Sitz in der Ausgabeöffnung (31) aufweist und die ringförmige Arretierungsrippe (33) einen dichten Sitz in der ersten Nut (35) aufweist,

wobei der Verschlußkörper (26) eine dritte offene Stellung aufweist, in der die Ausgabeöffnung (31) von dem Stutzen (25) axial beabstandet ist und die Dichtwulst (39) in dichtem Eingriff mit der Innenfläche der rohrförmigen Hülse (16) ist, wenn die Wulst (39) in verschiebbarem Eingriff mit der rohrförmigen Hülse (16) ist.

10. Ausgabeverschluß nach Anspruch 9, wobei jede Ringnut (35 und 37) einen rechteckigen Querschnitt aufweist und die Arretierungsrippe (33) einen gebogenen Querschnitt aufweist, wodurch die Rippe (33) längs der Hülseninnenfläche einen Zweipunkteingriff mit der Nut (35, 37) aufweist.

11. Ausgabeverschluß nach einem der Ansprüche 1 bis 10, wobei die Arme (19, 19a) auf einer diametralen Linie angeordnet sind, die sich durch die zentrische Achse (8) des Kappenelementes erstreckt, wobei die Ringräume zwischen den Armen (19, 19a) für das Hindurchlaufen von Flüssigkeit offen sind.

Revendications

1. Fermeture de distribution de liquide pour un flacon compressible, comprenant :

un élément formant chapeau unitaire (10, 10a), circulaire, en matière plastique ayant une paroi d'extrémité (12), une jupe annulaire (14) qui part axialement de la paroi d'extrémité du flacon pour se disposer autour du goulot d'un flacon compressible, un manchon tubulaire (16) qui part axialement de la paroi d'extrémité (12) pour définir une ouverture de bouche (17), deux bras (19, 19a) qui partent axialement de ladite paroi d'extrémité (12), dans l'espace circonscrit par la jupe (14), un disque de soupape radial (21) relié aux bras (19, 19a) dans une position espacée axialement de ladite paroi d'extrémité (12), un bouchon cylindrique (23) qui part axialement dudit disque (21) pour former une surface de soupape cylindrique (24), et une tige cylindrique (25) qui part axialement dudit bouchon (23) en traversant ladite ouverture de bouche (17) définie par ledit manchon tubulaire (16), et

un corps de fermeture unitaire (26), en matière plastique, formant poussoir et tirette, qui comprend une paroi latérale tubulaire allongée (27) qui s'étend à l'intérieur et au travers de l'espace défini par le manchon tubulaire (16), et une paroi d'extrémité à rebord (29) pouvant être actionnée manuellement, qui s'étend transversalement à la paroi latérale tubulaire (27) à l'extérieur de l'élément formant chapeau (10, 10a), ladite paroi d'extrémité à rebord (29) présentant une ouverture distributrice de liquide (31) dans l'alignement axial de ladite tige (25), de sorte que le mouvement axial du corps de fermeture (26) emboîte l'ouverture distributrice (31) sur la tige (25) ou l'en dégage, ladite paroi latérale tubulaire (27) ayant une zone d'extrémité libre (40) éloignée de la paroi d'extrémité à rebord (29) et adaptée pour s'emboîter télescopiquement sur ledit bouchon cylindrique (23) ou s'en dégager télescopiquement pendant le mouvement axial du corps de fermeture (26),

ledit manchon tubulaire (16) ayant au moins une gorge annulaire intérieure (35, 37) à proximité de son ouverture de bouche (17), ladite paroi latérale tubulaire (27) ayant une nervure d'encliquetage annulaire (33) de dimension appropriée pour s'engager dans la au moins une gorge annulaire (35, 37) pour former un joint étanche aux liquides entre le manchon (16) et la paroi latérale tubulaire (27),

ledit corps de fermeture (26) pouvant prendre une position fermée, dans laquelle ladite tige (25) forme un joint étanche avec ladite ouverture distributrice (31) et dans laquelle ladite nervure d'encliquetage annulaire (33) se loge à joint étanche dans ladite au moins une gorge annulaire (35, 37),

ledit corps de fermeture (26) pouvant prendre une position ouverte dans laquelle ladite ouverture distributrice (31) est espacée axialement de ladite tige (25), caractérisée en ce que ladite paroi latérale tubulaire (27) présente un bourrelet obturateur annulaire (39) adapté pour s'appuyer en coulissant contre la surface intérieure du manchon tubulaire (16), l'extrémité libre de la paroi latérale tubulaire (27) présentant deux ailettes (41) qui rayonnent vers l'extérieur, adaptées pour se déplacer entre ledit disque (21) et ladite paroi d'extrémité (12) de l'élément formant chapeau pour limiter le mouvement du corps de fermeture (26), et dans lequel ledit bourrelet obturateur (39) est en contact de joint étanche avec la surface intérieure du manchon tubulaire (16) lorsque le bourrelet (39) est en contact coulissant avec le manchon tubulaire (16).

2. Fermeture de distribution selon la revendication 1, dans laquelle:

l'extrémité libre (40) de ladite paroi latérale

tubulaire (27) encercle ledit bouchon (23) à joint étanche lorsque le corps de fermeture (26) est dans sa position fermée.

3. Fermeture de distribution selon la revendication 1, dans laquelle :

le diamètre extérieur de la paroi latérale tubulaire (27) est plus petit, de façon mesurable, que le diamètre intérieur du manchon tubulaire (16), de sorte que le manchon (16) n'oppose pas de résistance de frottement au mouvement axial du corps de fermeture (26).

4. Fermeture de distribution selon la revendication 1, dans laquelle :

la gorge annulaire (35, 37) est rectangulaire en section transversale, et ladite nervure d'encliquetage (33) est de section transversale curviligne, de sorte que ladite nervure (33) entre en prise avec la gorge (35, 37) en deux positions espacées sur la longueur de la surface intérieure du manchon.

5. Fermeture de distribution selon la revendication 4, dans laquelle :

la dimension de profondeur radiale de la gorge annulaire (35, 37) est plus grande de façon mesurable que la saillie radiale de la nervure d'encliquetage (33).

6. Fermeture de distribution selon la revendication 4, dans laquelle :

le bourrelet obturateur (39) est triangulaire en section transversale, avec sa zone de sommet dirigée vers la surface intérieure du manchon tubulaire (16).

7. Fermeture de distribution selon la revendication 1, dans laquelle :

lesdits bras (19, 19a) ont des fentes (45) s'étendant circonférentiellement, qui communiquent avec une face dudit disque radial (21), et ledit corps de fermeture (26) peut être tourné manuellement pour placer lesdites ailettes (41) qui rayonnent vers l'extérieur dans lesdites fentes (45).

8. Fermeture de distribution selon la revendication 7, dans laquelle :

chaque fente (45) est définie en partie par une surface de toit (47) inclinée d'un angle aigu sur le plan du disque radial (21), de sorte que lesdites ailettes (41) sont coincées de façon serrée contre la surface de disque (24) pendant le mouvement qui les introduit dans les fentes (45).

9. Fermeture de distribution selon une des revendications 1 à 8, dans laquelle :

ledit manchon tubulaire (16) présente une première et une deuxième gorges annulaires intérieures (35, 37) espacées axialement à proximité de son ouverture de bouche (17), et ladite nervure annulaire d'encliquetage (33) est dimensionnée de façon à s'engager sélectivement dans l'une ou l'autre des gorges annulaires (35 ou 37) pour former un joint étanche aux liquides entre le manchon (16) et la paroi latérale tubulaire (27), et
ledit corps de fermeture (26) peut prendre une première position fermée, dans laquelle ladite tige (25) forme un joint étanche avec ladite ouverture distributrice (31) et ladite nervure annulaire d'encliquetage (33) forme un ajustement étanche dans ladite deuxième gorge (37),
ledit corps de fermeture (26) peut prendre une deuxième position fermée dans laquelle ladite tige (25) est à ajustement étanche dans l'ouverture distributrice (31) et ladite nervure annulaire d'encliquetage (33) est engagée à joint étanche dans ladite première gorge (35), et
ledit corps de fermeture (26) peut prendre une troisième position ouverte dans laquelle ladite ouverture distributrice (31) est espacée axialement de ladite tige (25) et ledit bourrelet obturateur (39) est en contact à joint étanche avec la surface intérieure du manchon tubulaire (16), lorsque le bourrelet (39) est en contact coulissant avec le manchon tubulaire (16).

10. Fermeture de distribution selon la revendication 9, dans laquelle :

chaque gorge annulaire (35 et 37) est rectangulaire en section transversale et ladite nervure d'encliquetage (33) est de section curviligne, de sorte que ladite nervure (33) est en contact en deux points avec la gorge (35, 37) sur la longueur de la surface intérieure du manchon.

11. Fermeture de distribution selon une des revendications 1 à 10, dans laquelle :

lesdits bras (19,19a) sont disposés sur une ligne diamétrale qui passe par l'axe central (8) de l'élément formant chapeau, les espaces circonférentiels entre lesdits bras (19, 19a) étant ouverts pour laisser le liquide passer à travers ces espaces.

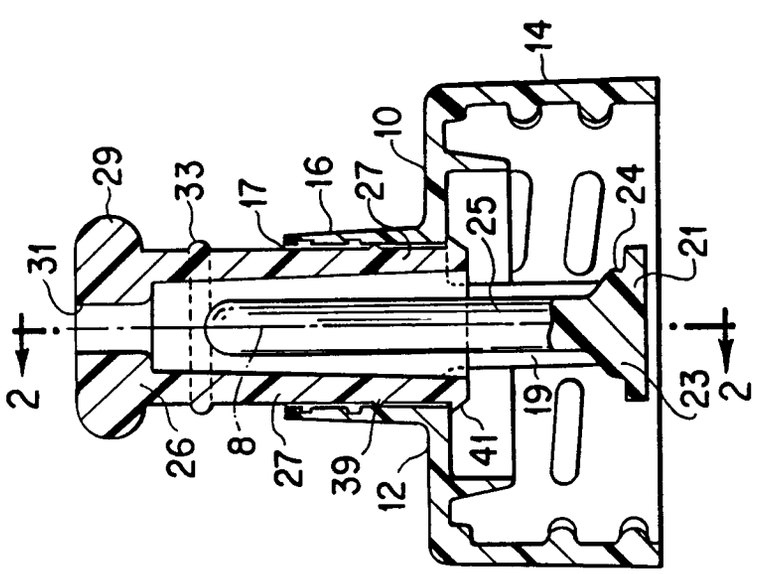


FIG. 1

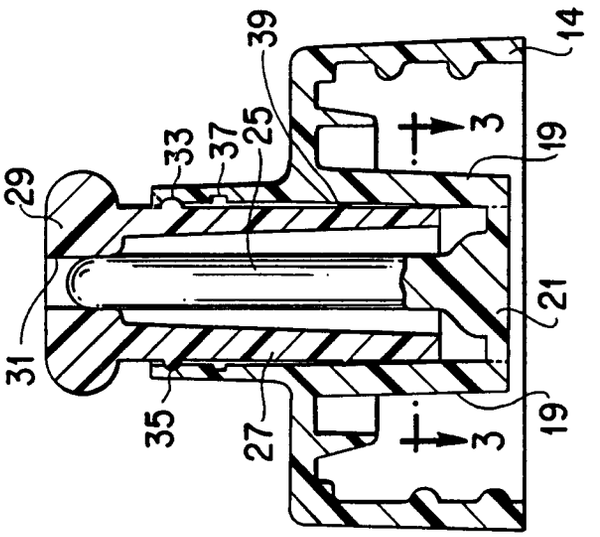


FIG. 2

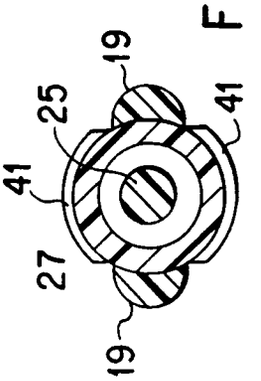


FIG. 3

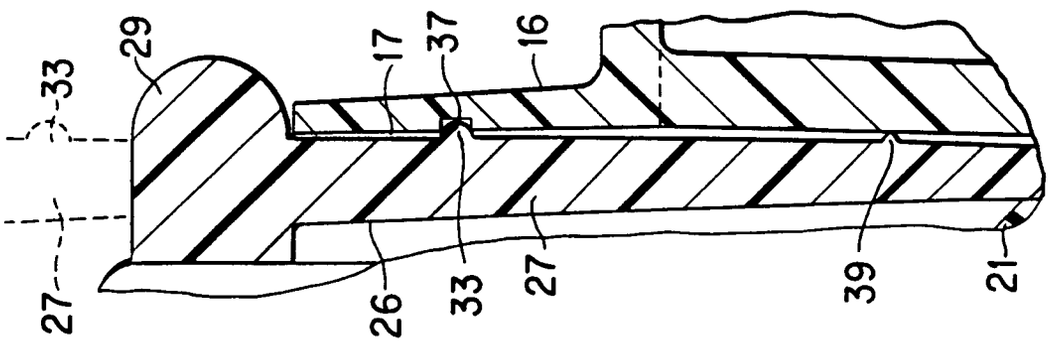


FIG. 6

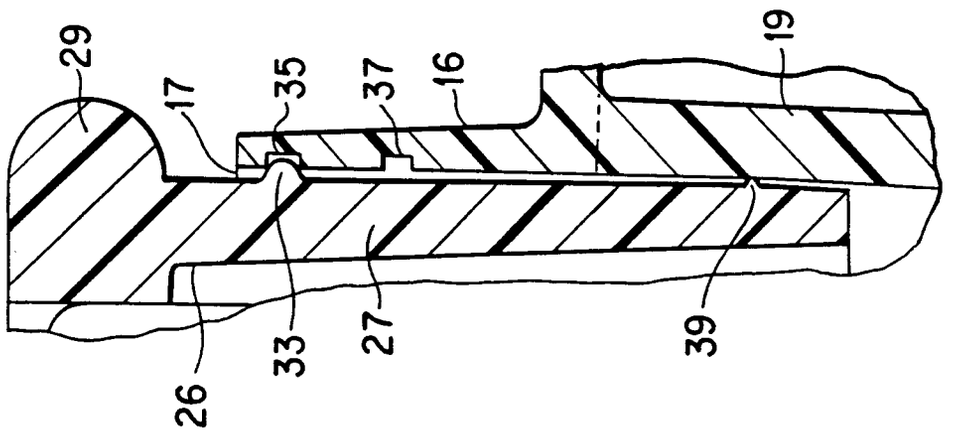


FIG. 5

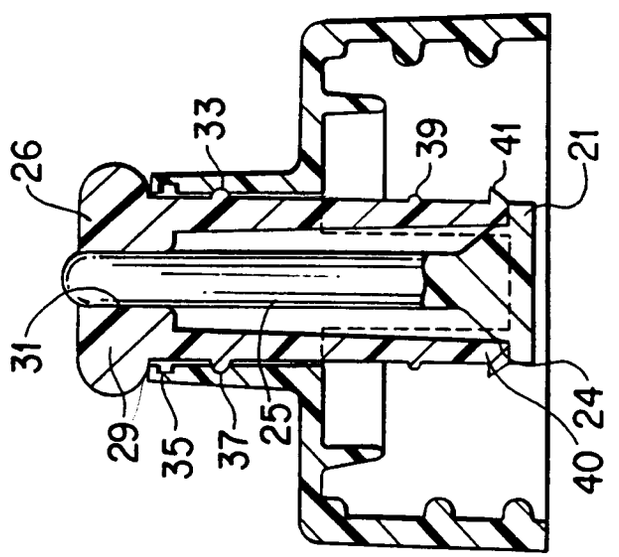


FIG. 4

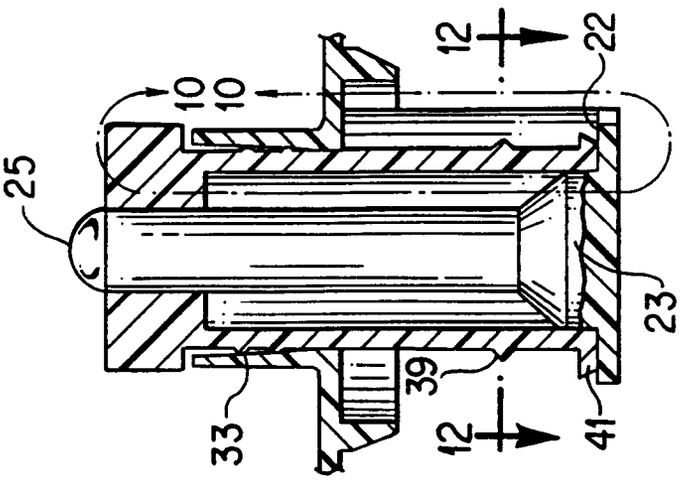


FIG.9

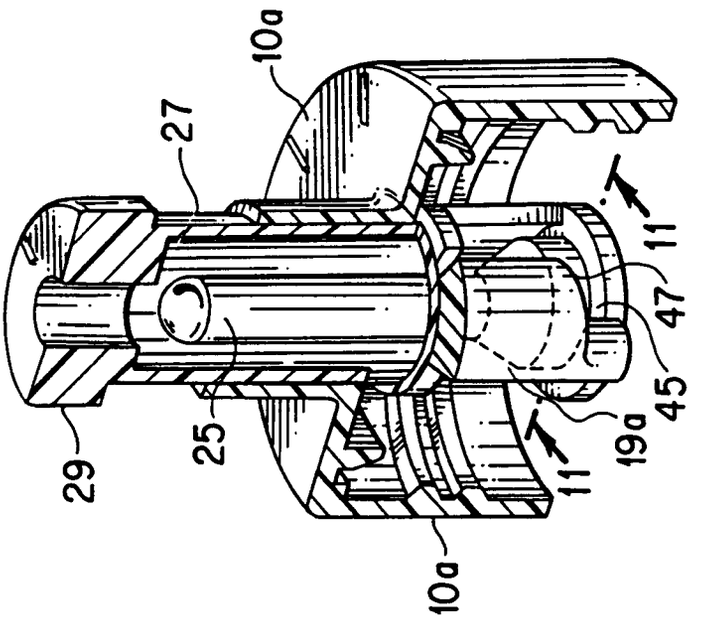


FIG.8

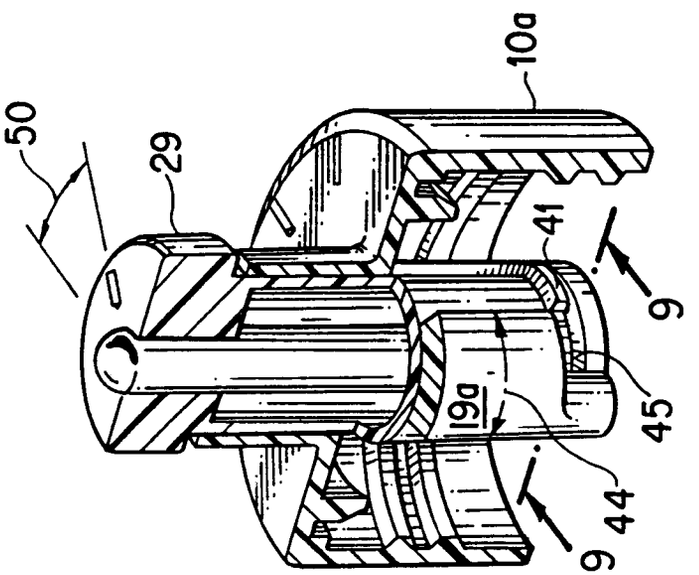


FIG.7

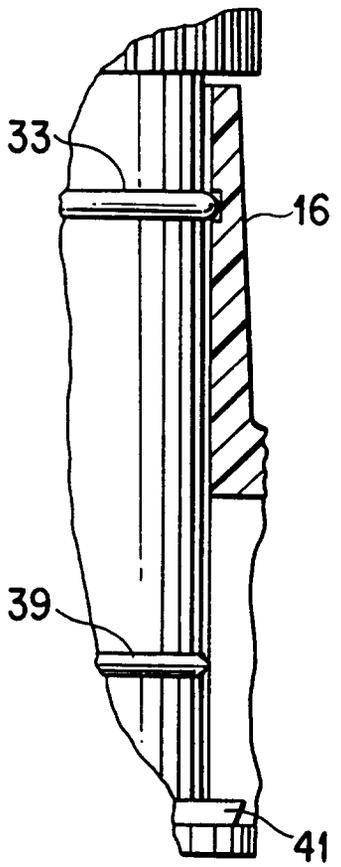


FIG.10

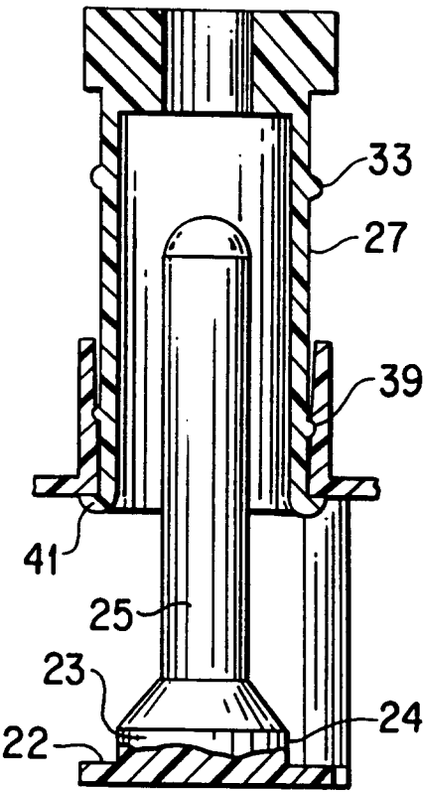


FIG.11

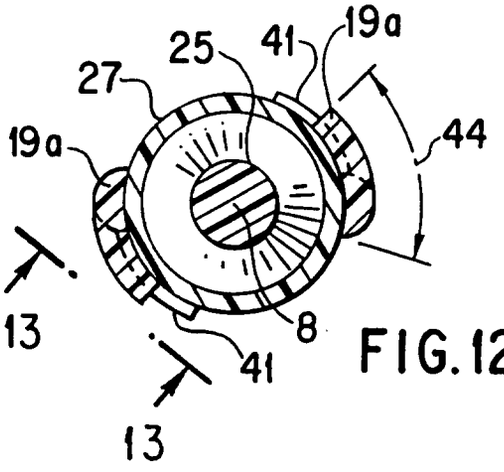


FIG.12

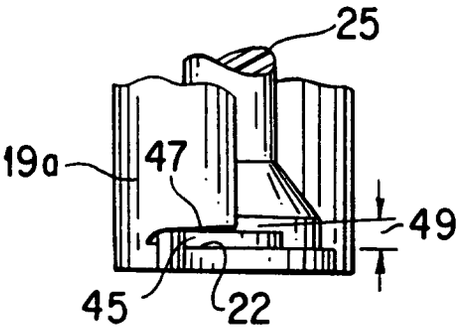


FIG.13